

**AERONAUTICAL CHARTING FORUM**  
**Instrument Procedures Group**  
**April 28, 2009**  
**HISTORY RECORD**

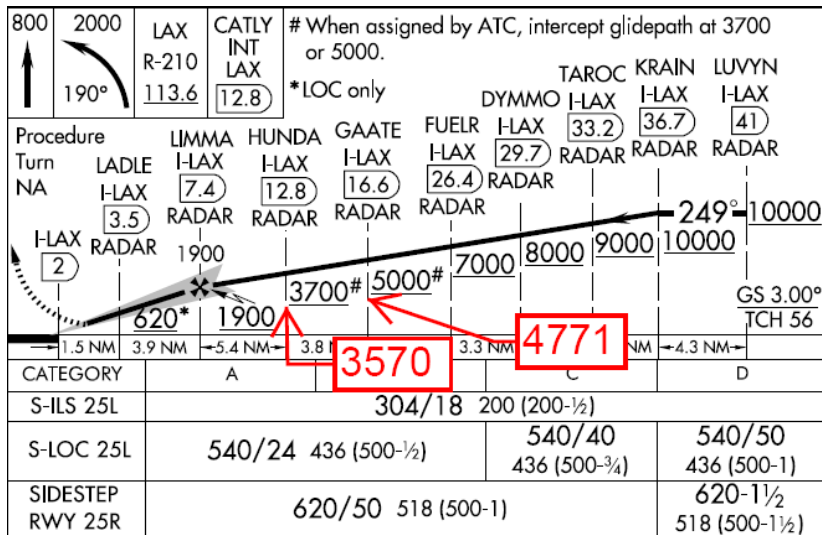
**FAA Control # 09-01-283**

**Subject:** Intermediate Fix Altitudes & ILS Glide Slope

**Background/Discussion:**

Based on industry observation, there appears to be a mistaken belief among pilots that the ILS glide slope descent angle is established such that the published minimum altitude for step-down fixes in the intermediate segment that precede the glide slope interception altitude will be achieved if the pilot elects to intercept and track the ILS glide slope during the intermediate segment descent.

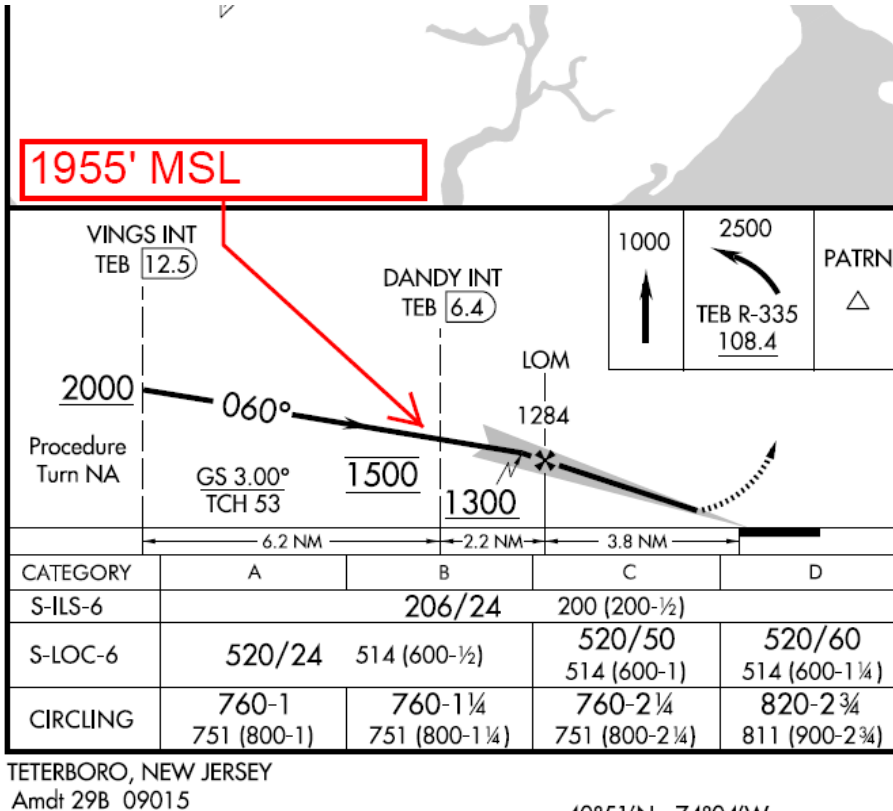
Should the pilot elect to intercept and track the ILS glide slope at a point prior to the glide slope interception altitude, this action does not necessarily ensure that subsequent fixes will be crossed at or above the published minimum crossing altitude, an expectation which is stated in AIM 5-4-5 (b)(1). An example of this situation may be seen on the ILS 25L at Los Angeles, CA (LAX) as depicted below:



The estimated ILS glide slope MSL crossing altitudes (depicted by red boxes) for the intermediate fixes GAATE and HUNDA clearly show that the ILS glide slope may not cross the fix at or above the published minimum crossing altitude. This situation is further exacerbated during conditions where higher than standard temperatures induce significant altimetry errors, a common situation in the Los Angeles basin during the summer months. Warm temperature altimeter errors result in an even greater difference between the barometric fix crossing altitude resulting from tracking the glide slope and the published minimum crossing altitude for each fix.

While ATC may authorize a pilot to intercept and track the glide slope above the glide slope interception altitude in support of parallel simultaneous ILS approach operations, as noted on the approach chart, absent such authorization the pilot must meet all published altitudes for each fix in accordance with AIM 5-4-5b.

When cleared for the approach, quite often the pilot will intercept and track the ILS glide slope at the earliest opportunity perhaps believing that the glide slope will ensure that published fix crossing altitudes will be achieved. However, this practice has resulted in numerous pilot deviations of the mandatory 1,500 ft MSL crossing altitude published at DANDY intersection on the Teterboro, NJ ILS RWY 6 approach:



As can be seen in the above example, the ILS glide slope crosses DANDY well above the published mandatory altitude.

### **Recommendations:**

To ensure that pilots thoroughly understand the appropriate use of the glide slope during an ILS approach, NBAA suggests adding to AIM section 5-4-5-b the following additional paragraph:

5. The ILS glide slope is intended to be intercepted at the published glide slope intercept altitude, which is depicted by the "lighting bolt" symbol on US Government charts. Intercepting the glide slope at this altitude marks the beginning of the final approach segment and will provide required obstacle clearance from the glide slope intercept altitude to lowest published decision altitude for the approach. Interception and tracking of the glide slope prior to the glide slope interception altitude does not necessarily ensure that minimum, maximum, and/or mandatory altitudes published for any preceding fixes in the intermediate segment will be complied with during the descent. If the pilot chooses to track the glide slope prior to the glide slope interception altitude, they remain responsible for complying with published altitudes for the intermediate fixes encountered during the subsequent descent.

To re-enforce this requested AIM guidance, NBAA also request that an expanded explanation of the intermediate segment step-down fixes, fix published crossing altitudes, and the relationship of the ILS glide slope to these crossing altitudes be provided in the next revision of the Instrument Procedures Handbook.

**Comments:** This recommendation affects the Aeronautical Information Manual and the Instrument Procedures Handbook

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**Initial Discussion - Meeting 09-01:** New issue presented by Rich Boll, NBAA. This issue is closely tied to issue 09-01-282; however, it relates to pilots intercepting and tracking the glide slope prior to the specified precise final approach fix (PFAF), which is identified by a lightening bolt on FAA charts, without ATC clearance. Many pilots believe that flying the glide slope at the earliest point will ensure that all altitude restrictions will be met. This is not the case as is demonstrated by the Teterboro, New Jersey ILS RWY 6 IAP, which has a mandatory altitude restriction in the intermediate segment. Lance Christian, NGA asked if this issue didn't contradict the previous issue (09-01-282). Rich responded no, because the pilot in this case was not assigned a glide slope intercept altitude. Rich provided a recommended new subparagraph 5 for AIM paragraph 5-4-5b that will provide better pilot guidance. The proposal will be forwarded to AFS-410 for action. **ACTION: AFS-410.**

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**Meeting 09-02:**

**Editor's Note:** *This issue and 09-01-282 were discussed simultaneously. The minutes are written to reflect and clarify pertinent points made regarding each issue. This issue addresses pilots intercepting and tracking the glide slope (GS) prior to the PFAF when cleared for an ILS approach.*

The discussion centered primarily on the Teterboro, NJ ILS RWY 6 IAP. The procedure has a minimum intermediate fix (IF) (VINGS) altitude of 2000 and specifies a mandatory IF stepdown fix (DANDY) altitude of 1500, prior to the 1300 GS intercept altitude. Pilots routinely, upon receiving clearance for the approach, intercept and fly the GS at 2000, thus missing the mandatory 1500 restriction, which is established to provide vertical separation with aircraft arriving Newark. Various chart notes and ATC clearance phraseology were discussed. Gary Fiske, AJT-28, stated that most controllers at Newark include the phrase "cross DANDY at 1500" in the approach clearance; however some pilots still opt to fly the GS and miss the restriction. Ted Thompson, Jeppesen, stated that his research indicated the procedure coding is correct. Ted added that Jeppesen's representation of the ILS GS intercept in the profile illustrates the unique 1500 foot mandatory crossing altitude below the GS at DANDY. This charting methodology received favorable comment. The Jeppesen depiction was the direct result of a Non-Standard Special Revision Order requested separately, by a representative of the FAA. Brad Rush, AJW-372, mentioned that the problem could possibly be resolved by revising the IAP lateral track and profile and he will have the procedure developers for Teterboro check into it. Dan Diggins, AJT-28, stated that he believes an FAA safety inspection to review Teterboro is scheduled. Tom Schneider recommended that AFS-410 review the NBAA original recommendation document that requested the addition of another subparagraph AIM paragraph 5-4-5-b to clarify pilot responsibilities when intercepting the GS prior to the PFAF or as assigned by ATC (see issue 09-01-282). **ACTION: AFS-410 and AJW-372.**

**MEETING 10-01:** Bruce McGray, AFS-410, stated that this issue is closely related to 09-01-282. The difference is that issue 09-01-282 relates to ILS approaches where multiple GS intercepts may be assigned by ATC for simultaneous operations. This issue relates to a pilot opting to intercept and fly the glideslope from an altitude higher than the specified GS intercept altitude, thus ignoring pre-PFAF mandatory or minimum altitude restrictions. Bruce stated that his office has also been looking into this issue and agrees the AIM guidance could be better. He is proposing the NBAA submission to add a new AIM sub-paragraph 5-4-5-b-5 be revised as follows (changes in red):

The ILS glide slope is intended to be intercepted at the published glide slope intercept altitude. **This point marks the precise final approach fix (PFAF) and** is depicted by the "lightning bolt" symbol on US Government charts. Intercepting the glide slope at this altitude marks the beginning of the final approach segment and **ensures** required obstacle clearance **during descent** from the glide slope intercept altitude to **the** lowest published decision altitude for the approach. Interceptation and tracking of the glide slope prior to the **published** glide slope interception altitude does not necessarily ensure that minimum, maximum, and/or mandatory altitudes published for any preceding fixes in the intermediate segment will be complied with during the descent. If the pilot chooses to track the glide slope prior to the glide slope interception altitude, they remain responsible for complying with published altitudes for the intermediate fixes encountered during the subsequent descent. ~~unless specifically assigned a higher published glide slope intercept altitude by ATC. Higher authorized intercept altitudes are indicated on the procedure chart by an asterisk (or other~~

~~attention symbol) and annotated in the profile view of US government charts as follows: "When assigned by ATC, intercept and track glidepath." When so cleared, subsequent published altitude restrictions may be ignored.~~

After discussion, the consensus was that the strikethrough portion above should be deleted. Mike Frank, AJT-28, stated that this issue should be worked simultaneously with issue 09-01-282 and both resolved together. The group agreed. Brad Rush, AJW-372, reported that he contacted New York TRACON regarding a possible procedure re-design to eliminate the mandatory 1500 altitude restriction on the Teterboro ILS RWY 6 approach. The TRACON rejected the proposal saying the currently published 2000 and 1500 altitudes are necessary for procedural separation. **ACTION: AFS-410**

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**MEETING 10-02:** Bill Hammett, AFS-420 (ISI), briefed that the recommended AIM change to paragraph 5-4-5-b to resolve this issue has been forwarded for publication on March 10, 2011. The group consensus was that this AIM change should go forward as recommended. Mark Ingram, ALPA, stated that there seems to be some confusion as to whether "glidepath" or "glideslope" should be used. Tom Schneider, AFS-420, responded that in the Pilot/Controller Glossary, the terms are interchangeable in the US. Brad Rush added that further coordination with ATC at Teterboro revealed that the problem there has been resolved through an ATC phraseology enhancement. Controllers now include "cross DANDY at 1500" in the approach clearance. AFS-410 will continue to track the AIM change.

**Item Open Pending Publication (AFS-410).**

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**MEETING 11-01:** Bill Hammett, AFS-420 (ISI), briefed that the recommended AIM change to add an explanatory note below paragraph 5-4-5-b4 to resolve this issue was published on March 10, 2011. A copy of the change as published was provided all attendees and is included below:

***Note 2.** The ILS glide slope is intended to be intercepted at the published glide slope intercept altitude. This point marks the PFAF and is depicted by the "lightning bolt" symbol on U.S. Government charts. Intercepting the glide slope at this altitude marks the beginning of the final approach segment and ensures required obstacle clearance during descent from the glide slope intercept altitude to the lowest published decision altitude for the approach. Interception and tracking of the glide slope prior to the published glide slope interception altitude does not necessarily ensure that minimum, maximum, and/or mandatory altitudes published for any preceding fixes will be complied with during the descent. If the pilot chooses to track the glide slope prior to the glide slope interception altitude, they remain responsible for complying with published altitudes for any preceding stepdown fixes encountered during the subsequent descent.*

Bill recommended the issue be closed and the group agreed.

**Status:** **Item Closed.**

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